Cortaro Water Users' Association

As Agents for

Cortaro-Marana Irrigation District

Supervisory Control & Data Acquisition (SCADA) Project

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Supervisory Control & Data Acquisition
Grant Report & Request for Payment
Contract 2019-3074IGA Tucson AMA

Background Data

The Cortaro Water Users' Association (CWUA) is the agent for the Cortaro-Marana Irrigation District (CMID) who owns all the assets of the District. The District was organized in 1964 and the Cortaro Water Users' Association which has been known by various names was first organized in 1918 as Cortaro Farms. In 1946, holdings and land were sold to individuals and the Cortaro Water Users' Association was incorporated. Currently the district has 42 operating wells and 3 pumps to transfer water from the CAP Canal to irrigation canals. CMID has a groundwater savings facility permit, a recovery well permit, and certificates of water rights. The groundwater savings facility can store up to 20,000 acre-feet of in-lieu water if the total withdrawn for the district is under 60,000 acre-feet per year.

Project Summary

CMID wells deliver over 30,000 acre-feet of water every irrigation season and currently rely on visits to each of the District's 42 wells and 3 pumps to turn them on, off, or assess their current condition. If the well or pumps are in use, they are visited several times each day. This project will provide a SCADA system to be installed on 6 wells. The data and remote access will be available at the office and on mobile devices. Currently the only way to turn on and off the wells is to physically be on the well site. The SCADA system will also send alarm notifications in case of power failures at the well site. The sites chosen for this project are wells that are difficult to access during rain or are at the far ends of the district. Because of this, these wells run longer than needed, until it is possible to access the well site. This can take between 12 and 72 hours depending on the severity of the storm or up to 1 hour on a normal day when people are working in a different area. CMID wells produce between 1 and 8 cubic feet per second or between 27,172 - 217,376 gallons per hour.

Project Deliverables

The original timeline was for installation of the Controllers and remote terminal units was in December 2018 to February 2019 and final testing in March of 2018. Due to focus on the Drought Contingency Plan, approval of this project was not received until May of 2019 causing roughly a one-year difference in the proposed versus actual dates, due to installation needing to be done mainly in the winter months.

Deliverable: Testing of well site connectivity to office and other sites.

With the help of Interactive Controls Inc. (ICI). We were able to set up some temporary antennas and check the quality of signals between areas of the district where the new SCADA units would be installed. One area of concern was found, and this was overcome by purchasing larger/stronger antennas for two sites. Since these antennas have been installed no communications issues have been noticed. This was completed in March 2020

Deliverable: Installation of Controllers, Terminal Units, Antennas and wiring.

Interactive Controls built the remote terminal units, and CWUA personnel hung the cabinets, placed the antennas and ran the wiring. Once completed ICI returned and wired them up and connected the units to our SCADA system using the existing software purchased in phase one of our installation. Units were installed in 2 phases with the second phase being completed in February 2020

Deliverable: Testing of Remote Terminal Units and software.

Once each unit was installed, the SCADA system was placed into service and we began using it. Because of this some wells were tested much longer than others. Bugs in the program were identified and corrected with a final update completed in early April 2020.

Requested Funds

QTY	Description	Each	Total
6	Remote Terminal Installation	$11,000	$66,000
6	Electrical Wiring for new Cabinet	$1,500	$9,000
		Total	$75,000

Funds Used

6	Remote Terminal Installation	$11,000	$66,841.59
2	High Performance Antennas		$ 2,008.84
1	Wiring, Conduit, connectors		$ 1,049.38
1	Additional Programming and Troubleshooting		$ 2,250.00
1	400HP Watertronics Soft Start		$10,962.90
		Total Spent	$83,112.71

Well Site 8J

Remote Terminal Unit

Well Site 14

Remote Terminal Unit

Well Site 15

Remote terminal Unit

Well Site 16F1

Remoter Terminal Unit

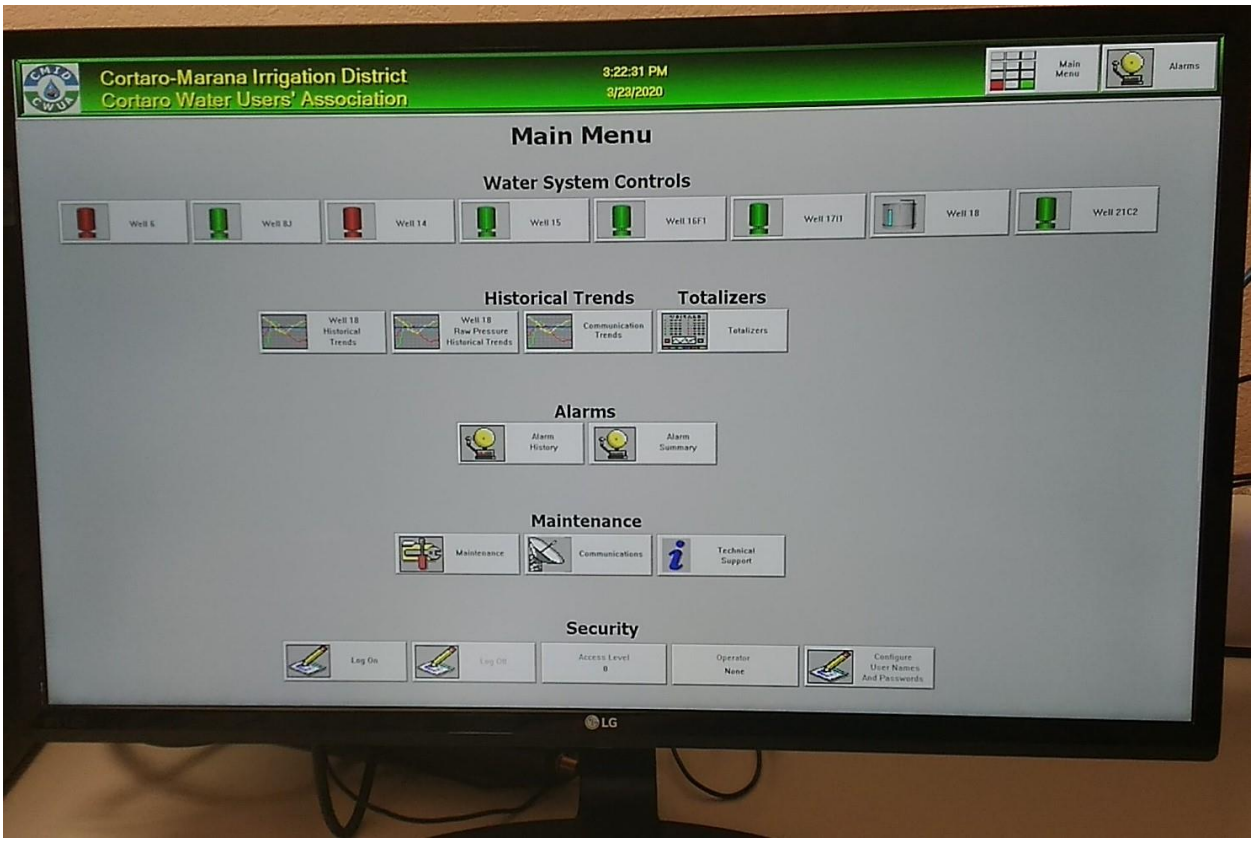
Well Site 17I1

Remote Terminal Unit

Well Site 21C2

Remote Terminal Unit

SCADA System Screen shot



System currently has 8 Wells on-line including the 6 paid for by the Arizona Department of Water Resources. Red colored wells are currently off, green colored wells are currently in use. A Bureau of Reclamation WaterSMART grant was awarded that will allow an additional 8 wells to be connected to the SCADA system.

Savings Year-to-Date

Date	Amount Saved Ac-Ft	Description
3-Feb-20	1.0	Well automatically restarted after power Failure.
3-Mar-20	.375	Turn on replacement pump
11-Mar-20	4.67	Turn off in middle of night instead of morning
19-Mar-20	.54	Alarm notification, able to restart well quickly
Total		